## REMARKS

Claims 1-48 are all the claims pending in the application. Claims 13-23 and 33-43 were withdrawn from consideration pursuant to a election of species requirement. This Amendment adds claims 44-48 and addresses each point of rejection raised by the Examiner. Favorable reconsideration is respectfully requested.

Applicant thanks the Examiner for acknowledging the claim for foreign priority under 35 U.S.C. § 119, noting that the priority documents have been received, and initialing the Information Disclosure Statement filed August 27, 2001.

Claims 1-12 and 24-32 have been rejected under 35 U.S.C. § 103(a) as being unpatentable over Sonoda (JP-10-254001) and Takano (US 5,790,578 A). Applicant respectfully traverses the grounds of the § 103(a) rejection for the reasons set forth below.

Sonoda was incorporated by reference into the present application. *See* page 24, lines 6-8. As explained on pages 1 and 2 of the present application, Sonoda discloses an optical wavelength conversion element which comprises a substrate made of a ferroelecctric crystal exhibiting a nonlinear optical effect, an optical waveguide formed on the substrate, and domain-inverted portions periodically formed along the optical waveguide. Such an optical wavelength conversion element converts a fundamental wave propagating in the optical waveguide to a second harmonic or the like. In the domain-inverted portions, the direction of spontaneous polarization of the substrate is inverted.

In Sonoda, the semiconductor laser module (or an optical wavelength conversion module) in which an optical wavelength conversion element is coupled to a semiconductor laser element which emits a laser beam as a fundamental wave. An external resonator including an optical

wavelength selection element (such as a narrow band-pass filter) is combined with a semiconductor laser element which emits a laser beam as a fundamental wave so that an oscillation wavelength of the semiconductor laser element is locked at a desired wavelength.

While Sonoda and a preferred embodiment of the present invention both utilize an external resonator for determining wavelength, Sonoda does not teach or suggest the claimed semiconductor laser element comprising a MQW active layer including a plurality of quantum-well sublayers each having a thickness and a composition, where one of the plurality of quantum-well sublayers is different from another of the plurality of quantum-well sublayers in at least one of the thickness and the composition, as acknowledged by the Examiner.

The Examiner cites Takano for the claimed semiconductor laser element. However, the laser of Takano includes structure for determining the oscillation wavelength inside the laser device. Specifically, Takano teaches a semiconductor laser device in which an oscillation wavelength is determined by an internal structure. There would be no advantage to combining such a structure with Sonoda. This wavelength selection mechanism in Takano would render the laser incompatible with Sonoda, at least to the extent that there would be any advantage or motivation to make the combination. Accordingly, Applicant respectfully submits that claims 1-12 and 24-32 are patentable over the combination of Sonoda and Takano. Reconsideration and withdrawal of the § 103(a) rejection are respectfully requested.

Further, while both Takano and the present invention disclose a multiple quantum well structure having different band-gap energies, Takano is addressing a different problem than the present invention. According to Takano, an active layer comprises two types of quantum well sub-layers, one of which has lower band gap energy and contributes only to electro-luminescence

(oscillation), and the other of which has higher band gap energy and contributes only to carrier accumulation (*i.e.,* no electro-luminescence). The carrier accumulation layer assures that carriers are available for injection if a deficiency in carriers occurs in the luminescent layer, thereby suppressing active wavelength chirping.

On the other hand, the present invention has a plurality of quantum well sub-layers having different band gap energies which contribute to oscillation with overlapping gain spectra of the plurality of quantum wells. The overall gain spectrum of the semiconductor laser device according to the present invention is greater than the overall gain spectrum of a laser element in which a plurality of quantum well sub-layer have an identical thickness and an identical composition.

To emphasize this difference, Applicant adds new dependent claims 47 and 48, further distinguishing the multiple quantum-well active layer of the invention from that of Takano. Claims 47 and 48 require:

> wherein an overall gain spectrum of said multiple-quantum-well active layer comprises a gain spectrum of said one of the plurality of quantum-well sublayers and a gain spectrum of said another of the plurality of quantum-well sublayers, said gain spectrum of said one of the plurality of quantum-well sublayers being different from said gain spectrum of said another of the plurality of quantum-well sublayers.

Support for this amendment may be found, for example, on page 19, line 8 to page 21, line 26, discussing Figs. 38A and 38B, and on page 41, line 4 to page 42, line 4. See also, page 69, lines 17-20; page 72, line 24 to page 73, line 3; page 79, lines 21-26; and page 80, line 18 to page. 81, line 2. No new matter is added.

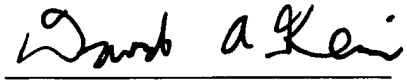
In comparison, the sublayers in Takano contributing only to carrier accumulation do not result in a wider overall gain spectrum. The wider overall gain spectrum is important, because it results in a wider wavelength range in which the laser oscillation can be effectively locked. Among other benefits, this makes adjustment operations for wavelength locking easier, and allows for more relaxed manufacturing requirements for composition and thickness control of the active layer.

Additionally, Applicant adds new claims 44-46. Entry and consideration are requested.

In view of the above, reconsideration and allowance of this application are now believed to be in order, and such actions are hereby solicited. If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below.

The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

Respectfully submitted,



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